There are 88 constellations in the sky around the Earth. 12 are the zodiac constellations that lie around the edge of the disk of the solar system. They are the constellations in which you will find the planets at various times of the year.

Ancient people looked for patterns in the sky to explain what they didn’t understand. As a result each star pattern is a figure about which they told heroic stories.

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Aries

The Science

Aries is a not a very noticeable constellation, it lies between Aldberan in Taurus, and the Square of Pegasus.

About 2000 years ago, the vernal equinox (the place the Sun rose on the first day of spring) was in the constellation Aries. Due to wobbling of the earth’s axis, this is no longer the case, but Aries is still regarded as the first constellation in the zodiac. Star co-ordinates are measured from the Aries.

Principal stars are Hamal (Alpha), magnitude 2.0 and Sheratan (Beta), magnitude 2.6. Mesartim (Gamma) is a nice optical double star, magnitudes 4.6 & 4.7, easily resolved with a small telescope. (Magnitude is a measure of how bright a star is - a magnitude 2 star is 2.5 times fainter than a magnitude 1 star. The faintest star you can see without a telescope is magnitude 6)

The Myths

Mesopotamia: the Sumerians called the sun, Subat, meaning the Ancient Sheep or Ram and the planets the Celestial Herd. The bright star in Aries, Hamal, meaning the lamb, represented one of the stars in the Scimitar, a celestial weapon that protected against the Seven Diabolic Spirits of the Storm. The Babylonian priest Berossos who lived around 275 BC said that the world was created when the Sun was in the Ram.

Ancient Egypt: during the time of Dionysus and his campaigns in Africa, his troops were traveling through a sandy desert. They ran out of water and were worn out struggling through the sand. A ram appeared before them, rose up in the air and landed behind a dune. When scouts followed the animal, they came upon a spring of water, but no ram. Dionysus ordered the building of a temple to Zeus Amon on the spot where the spring rose. A likeness of the ram was placed in the temple and the ram was placed in the heavens in a position of great importance.
Greek Zeus’ wife, Hera, had a suitor named Ixion who was tricked by Zeus into impregnating a cloud that had the likeness of Hera. The cloud, Nephele, bore a child and Ixion, as punishment for his attempted indiscretion with Zeus’ wife, was attached to a flaming wheel and forced to roll around the heavens for eternity. This is an early reference to the line of the ecliptic, the path of the sun as it moves through the sky. The child was the first centaur. Nephele was lonely and eventually fell in love with Athamas, the king of Böeotia and brother of Sisyphus. She had two children, Phrixus and Helle, who Athamus eventually tried to have sacrificed after he fell out of love with their mother. Hera sent a golden ram to their aid. They jumped on its back and were carried out of harm’s way, but not necessarily to safety. Helle lost her grip and fell to her death into the part of the sea that became known as the Hellespont. Phrixus landed at Colchis on the Black Sea and sacrificed the ram in honor of Zeus. He took the fleece of the ram and hung it in a sacred wood in his honor as well, leaving as its guard a dragon sometimes represented by the constellation Draco. This fleece became the stuff of which legends were made as it was sought by countless men not unlike the Holy Grail. The golden fleece of the ram was the treasure sought by Jason and his Argonauts.

North American Sierran tribe: Grizzly sisters (Aries) use to play with Deer sisters in a cave. One day Grizzly mother ate Deer mother. Deer sisters retaliated by trapping Grizzly sisters in the cave.

**Taurus**

The Science

Only part of the bull is represented by the constellation. Its head is depicted by the Hyades’, the ‘V’ shaped star cluster, its red eye is represented by Aldebaran. There is also the magnificent star cluster, the Pleiades, The Seven Sisters which is a truly great sight in binoculars, or telescopes with a wide field of view. Taurus also contains M1, the Crab Nebula,
sight of the famous supernova in 1054, now the source of a pulsar.

Principal stars are: Aldebaran Alpha Tauri, an irregular variable, magnitude 0.75 to 0.95; Elnath Beta Tauri, magnitude 1.7; Zeta Tauri, magnitude 3.0.

The Myths

**Mesopotamia**: the mythical Bull of Heaven who was called up by Anu for his daughter, Istar, to destroy the city of Uruk after she made amorous advances toward Gilgamesh. Istar was a goddess associated with extramarital sex, sexual behavior, prostitution and war, although not necessarily in that order. Unimpressed with Istar’s treatment of her several former lovers, Gilgamesh refused her attempts to add him to her stable. The Bull caused wide-spread destruction and was slain by Gilgamesh and his friend Enkidu. According to legend, Enkidu threw the thigh of the bull at Istar after the bull was killed. This explains the lack of the thigh in the constellation of the bull in the sky. See the legend of Orion.

**Ancient Egypt**: worshipped as the living symbol of Apis, the bull was a revered animal placed in the sky out of deference

**Greece**: Taurus was Zeus in disguise. Zeus fell in love with Princess Europa, the daughter of Agenor who was King of Phoenica. On one day while she was playing by the waters edge, she caught sight of a majestic white bull grazing amongst her fathers heard. When she approached the bull, it knelt down and let get on it’s back. Once she was on, it sprang to it’s feet and carried her off to Crete where Zeus made her his mistress.

It also represents the white bull that sired the famous Minotaur with the wife of King Minos of Crete. This bull was sent to Minos as a sign that he was the rightful heir to the throne. However, Minos did not sacrifice the bull to Poseidon as he was supposed to, so the vengeful sea god caused his
Queen, Pasiphaë, to fall in love with it. In another myth, Theseus of Athens goes to Crete and slays the dreadful Minotaur, which was reported to be a man with a bull’s head that could breathe fire.

North American Mono tribe: Six wives (Pleiades cluster) ate wild onions that gave them skunk breath. The Husbands (Hyades cluster) threw them out of their huts. When the wives went up into the sky to live, the lonely husbands followed but never caught them.

The Science

The twins are represented by the two stars Castor and Pollux. The two stars are useful for estimating angular separation, since they are exactly 4.5 ° apart. M34 (NGC 2168) is a large 5th magnitude star cluster, just visible to the naked eye.

Principal stars are: Pollux Beta Geminorum, magnitude 1.1; Castor Alpha Geminorum, magnitude 1.6; Alhena Gamma Geminorum, magnitude 1.9; Mebsuta Epsilon Geminorum, magnitude 3.0

The Myths

Castor and Pollux were members of Jason's crew aboard the Argo. The job of the twins was to protect the mariners, appearing, in the rigging, as St. Elmo's fire. The appearance of the constellation in the sky signaled the end of winter storms and safer passage.

Most harbors of the classical period had statues of the twins, Castor and Pollux, at their entrances in tribute to the brothers. The higher star in the constellation is Castor, the brighter one is Pollux. The twins also show up as two stars above the figure head on some ships.
Mesopotamia: The Great Twins, the brothers Lugal-irra and Meslamta-ea, stand at the entrance to the underworld ready to dismember the dead as they entered. Small statues of the brothers were often buried outside of doorways of houses and public buildings to protect the occupants.

Greece: identified with the twin sons of Zeus and Leda, the wife of Tyndareus. Zeus, disguised as a swan, seduced Leda who laid an egg from which Helen and Pollux were born. At the same time she also gave birth to Castor and Clytaemnestra, children of Tyndareus. Since Pollux was the child of a god, he was immortal. Castor was the mortal son of a man. The boys grew close as brothers and became widely famous for their athletic abilities. The Olympic games came about as a result of their prowess. A rivalry between the brothers and their twin cousins, Ida and Lynceus, caused the death of the mortal Castor. In his grief, Pollux asked Zeus to permit him to die so he could remain with his brother. Touched, Zeus placed the boys in the sky as a symbol of brotherly love and devotion.

Cancer

The Science
Cancer is the faintest of the constellations, but is well known, since it is a zodaical constellation. There are two Messier objects, Praesepe (M44), The Beehive, one of the best naked eye open clusters. It has a magnitude of 3.7 & is close to Delta Cancri (Asellus Australis) and M67, another open cluster near Alpha Cancri (Acubens).

Principal stars are: Altarf (Beta Cancri), magnitude 3.5; Asellus Australis - Southern Donkey (Delta Cancri), magnitude 3.9; Iota Cancri, magnitude 4.0; Acubens - The Claw (Alpha Cancri), magnitude 4.2; Asellus Borealis - Northern Donkey (Gamma Cancri), magnitude 4.7

Noteable doubles are: Zeta Cancri, magnitudes 5.6 & 6.0 (A binary with separation 1 second of arc & a period of 60 years. Larger telescopes reveal it to be a multiple star.) and Iota Cancri, magnitudes 4.3 & 6.3 (Separation 31 seconds of arc)
In ancient times, the Sun reached its most northerly point, and appeared overhead, at latitude 23.5 degrees North on the summer solstice (21st June). For that reason, latitude 23.5N is known as the Tropic of Cancer, even though today, the solstice is in the nearby constellation of Gemini, due to the Earth’s precession.

The Myths

**Greece**: The most widely accepted story is that Cancer was sent by the goddess Hera to attack Hercules while he was battling with the Hydra on the second of his labours. During the struggle, the crab was crushed beneath the feet of Hercules. As a reward for its heroic, but futile, efforts, Hera placed the crab among the stars.

**Early Christianity** the manger occupies this position in the sky. Said to be the manger in which the Christ Child was born. It is visible from December to June. The two brightest stars of the constellation are said to be the donkeys present when the Child was born.

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**Leo**

The Science

Leo is one of the constellations of the Zodiac, and, in my view, one of the few constellations that actually looks like what it’s supposed to represent. It is very prominent, and contains much of interest. M65 and M66

Principal stars are Regulus - Little King (Alpha Leonis), magnitude 1.4; Denebola - Lions Tail (Beta Leonis), magnitude 2.1 & Algieba - Forehead (Gamma Leonis); actually a lovely double star, magnitudes 2.2 & 3.5.

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**The Myths**

Mesopotamia lions were a nuisance to the people of Mesopotamia. Lion hunting
became a popular sport of kings and a necessity to keep their populations down. The lion is associated with the warrior goddess, Istar. Representations of the hero-king Gilgamesh often show him with a club in one hand and a lion in the other. The sickle shape of the constellation containing the bright star Regulus was not lost on the farmers of early Mesopotamia. At the time that the solstice occurred within the sickle, the harvest of grains was underway. This portion of the constellation was known as Gis-mes, the Curved Scimitar.

**Egypt**: the sphinx of Giza dates to the fourth dynasty as does the Sirian, a lion with wings and the face of a woman. These are connected to the position of the sun within Leo during the solstice, the flooding of the Nile and the return of lions from the desert to the river.

**Greece**: the conquering of the Nemean lion, the first of the twelve labors of Hercules (Orion) is symbolized by this star group. According to legend, Hera ordered the creation of the lion by the moon, Selene, who put the lion in a cave in the Nemean Mountains where the battle between Hercules and Leo took place. After killing the lion, Hercules wore its skin as his symbol.

**Arabic astronomy**: an early Arab constellation called Asad, the lion, actually stretched over a much larger portion of the sky than present day Leo. It included stars from Gemini through Libra and as far north as Ursa Major and south to Hydra. Its size was later reduced and the name changed to Leo to match the classical star atlases.

**India**: there are 250 hymns in the Rig-Veda dedicated to Indra. This god of the rains, lightning and the solstice held the same power as the gods of Egypt who were responsible for the flooding of the Nile. When the sun entered this constellation the monsoon season returned life and fertility to the people of India. Leo represented Indra riding the sun to its highest point in the sky at this time of the year.
Virgo is one of the constellations of the Zodiac, and is sometimes known as The Maiden. The sun is in Virgo at the time of the autumnal equinox around September 23rd. The ‘upper’ part of the constellation resembles a crude ‘Y’, the bowl of which contains a large number of faint galaxies known as the Virgo Cluster. There are about 3,000 member galaxies of the Virgo Cluster, of which around 12, or so, can be seen with telescopes having apertures of 6" (150mm).

M49 is an 8th magnitude elliptical galaxy; M58 is a 10th magnitude spiral galaxy with a prominent bright core; M59 is a 10th magnitude elliptical galaxy; M60 is a 9th magnitude elliptical galaxy, which can be seen in 3" (75mm) telescopes; M87 is a well known 9th magnitude elliptical galaxy, which is both an optical and radio source, known as Virgo A.

Principal stars are Spica – Ear of Wheat (Alpha Virginis), magnitude 1.0; Porrima (Gamma Virginis), a well known double, integrated magnitude 2.8.

The Myths

Mesopotamia: the constellation is represented by the Hittite goddess Sala, goddess of fertility and agriculture as well as Nana, an agricultural goddess of Sumerian-Akkadian derivation. She is eventually associated with one of several goddesses known variously as Ishtar and Istar who represent springtime, the harvest, innocent and married love and eventually ritualized prostitution, war and death. This final incarnation is Istar, daughter of Anu the sky and known from the Epic of Gilgamesh. The constellation is sometimes referred to as the Furrow, with the brightest star of the constellation, Spica, representing a stalk of grain.

Egypt: Virgo represents the goddess Isis, the moon goddess-wife of
Osiris the god of fertility and agriculture, and mother of Horus the new moon. Isis originally represented the Great Mother, similar to Nana and Themis. She is usually depicted as a woman carrying a small child in her arms, probably the infant Horus. The image eventually came to represent the Virgin Mary holding the infant Jesus.

**Greece** well before the written word, the Great Mother existed. Long after the ascension of the male gods of classical mythology she still existed in the form of the Titan Themis. No god dared to work contrary to her wishes. Mother of the Hours and Order, Themis regulated the passage of time and the seasons and was known as the Great Goddess of Necessity. The mythical Hours, Eunomia, or Legal Order; Dice, or Just Recompense; and Irene, or Peace; were the goddesses of civilization and peace who guarded the gates of Olympus. When Dice felt that mankind no longer respected justice, she retreated to the mountains and later abandoned the earth for the sky becoming the constellation, Virgo.

Virgo represents the Goddess of Justice, with her scales represented by the nearby constellation of Libra. In another legend, Virgo represents Demeter, the Goddess of corn, and Spica represents the ear of corn.

**Libra**

Libra is small, faint and one of the constellations of the Zodiac. It represents the scales of justice held by the Goddess Astraea in the nearby constellation of Virgo. The names of the principal stars stem from the time of the ancient Greeks, when the constellation was part of Scorpio. It is one of the few constellations that actually looks like what it is supposed to represent.

In the figure, above, the names of the stars are abbreviated for clarity.

Principal stars are: Zubenelgenubi - **Southern Claw** Alpha Librae, a wide double, magnitudes 2.8 and 5.2; Zubenelschemali - **Northern Claw** Beta Librae, magnitude 2.6; Zubenelakrab - **Scorpion’s Claw** Gamma Librae, magnitude 3.9.
The Myths

This constellation represented the claws of Scorpius until separated into a scale at the time of Julius Caesar in 46 BC. The original Arabic names for the two bright stars in the constellation are al-Zuban al-Janubiyyah, meaning the Southern Claw, and al-Zuban al-Shamaliyyah, the Northern Claw. This is the only modern zodiacal constellation that does not represent a living being.

 Mesopotamia the brightness of the stars marking Libra were not always as they are today. At the time of Eratosthenes, the star known as the Northern Claw was actually brighter than the bright, red star Antares in Scorpius. It has since dimmed and Antares has brightened. This star was known by the Babylonians as the Lamp, the Light, Censer or Solar Lamp and represented the biblical tower of Babel where sacrificial fires burned.

 Rome sign shown on several coins as the scales of justice. It was championed by Julius Caesar who considered himself to be the dispenser of knowledge, fairness and justice.

SCORPIO

The Science

Scorpius is one of the constellations of the zodiac, and actually looks like the creature it is supposed to be. In astrological circles it is known as Scorpio. Orion still flees from the scorpion, since Orion is below the horizon when Scorpius rises.

It is a magnificent constellation, which lies in a rich part of the Milky Way. There is lots to see for users of small telescopes. Originally, Scorpius was a much larger constellation, but the stars which formed the claws now form the constellation of Libra. The red star Antares, which means 'like Mars', marks the scorpion's heart.

Scorpius contains the brightest X-ray source in the sky, Scorpius X-1, which has been identified with a 13th magnitude spectroscopic binary.
Principal stars are: Antares Alpha Scorpii, a red giant, variable, magnitude 0.9 to 1.8. Antares Alpha Scorpii, a red giant, variable, magnitude 0.9 to 1.8. Acrab Beta Scorpii, a lovely double, easily seen in small telescopes, magnitudes 2.6 and 4.9; Dschubba Delta Scorpii, magnitude 2.3. Zeta Scorpii a naked eye double, magnitudes 3.6 and 4.7.

The Myths

Mesopotamia: the scorpion is associated with the Semitic goddess, Ishara, wife of the corn god Dagan. He is said to have invented the plow. She is later associated with Istar, following the incorporation of Semitic mythologies into those of the Sumerians. Her scorpion is always represented with its sting up, ready to strike the unwary.

Greece: the scorpion is the celestial representation of the animal sent by Apollo to sting Orion. Orion still flees from the scorpion, since Orion is below the horizon when Scorpius rises. In the story of Phaëthon, the horses of the sun chariot became wild after flying too high in the sky and encountering the scorpion. In stellar catalogs, the legendary healer Ophiuchus is shown with his foot crushing Scorpius.

Maori: Maui was a powerful god but a poor fisherman. He snagged his hook (Scorpius) and line on the bottom of the sea and thought he had hooked a big fish. He pulled hard and pulled up the North Island of New Zealand, Te ika a Maui - The fish of Maui

Mayans: the Sign of the Death God

SAGITTARIUS

The Science

The centre of our Galaxy lies in Sagittarius, so there are plenty of rich star fields to see. There is a radio and infrared source, Sagittarius A, which marks the centre of our galaxy.

Sagittarius is is rich in star clusters and nebulae, and has more Messier objects
than in any other constellation.

The constellation is the site of the winter solstice, the point at which the Sun is farthest south of the equator.

Principal stars are: Rukbat (Airami) Alpha Sagittarii, magnitude 4.0; Arkab Prior Beta Sagittarii, magnitude 4.0; Kaus Australis Epsilon Sagittarii, magnitude 1.8; Kaus Media Alpha Sagittarii, magnitude 2.7.

The Myths

Mesopotamia associated with the minor god, Pabilsag, brother of the warrior goddess, Istar. Very little is written of him although he did have a minor cult following during the Old Babylonian period in the city of Larag. Obviously someone in serious need of a good agent! Occasionally represents Enkidu in the Epic of Gilgamesh. The close proximity to the constellation Taurus, the Bull of Heaven, and Orion as Gilgamesh, makes sense here. The constellation was known as the Divine Door through which souls departed with the arrival of the autumnal equinox.

Greecasometimes, and incorrectly, identified as the centaur Chiron. Sagittarius actually represents the son of Pan named Crotus. Living on Mount Helicon with the Muses, he became their friend and protector. He invented applause as a sign of appreciation for their talents. A skilled hunter and good friend to the Muses, they asked that Zeus give him a constellation fitting his kind nature. With the goat-god Pan as his father, Crotus should be considered a satyr rather than a centaur. His representation as a centaur probably came from his superb riding skills. The representation of the centaur facing the constellation Orion the hunter with his arrow drawn is sometimes described as holding the scorpion at bay and sometimes as protecting the Muses from the unwanted romantic advances of Orion.
Capricorn

The Science

Capricorn is one of the zodiacal constellations and represents a goat with the tail of a fish. It contains M30, a globular cluster, magnitude 7.5, easily resolved by small telescopes with apertures greater than 100mm. (4 inches.)

About 2500 years ago, our Sun reached its most Southerly point, and appeared directly overhead, at latitude 23.5 degrees South on the winter solstice (about 22nd December). For that reason, latitude 23.5S is known as the Tropic of Capricorn, even though today, the solstice is in the nearby constellation of Saggitarius, due to the Earth’s precession.

Principal stars are: Deneb Algedi (Delta Capricorni), magnitude 2.9 - an eclipsing binary; Dabih (Beta Capricorni), magnitude 3.1; Algedi, or Giedi (Alpha Capricorni), a multiple star, magnitudes 3.6 & 4.2 for the principal components.

The Myths

Mesopotamia the carp-goat with the head and forelegs of a goat and the body of a fish. This constellation was the emperor’s sign and was associated with the god of the subterranean freshwater ocean, Enki. Enki is associated with wisdom, magic and incantations, and the arts and crafts of civilization.

Greece possibly the representation of the she-goat Amalthaea, who nursed the infant Zeus after he was hidden from his father, Cronus. Other stories tie the constellation to the man-goat god Pan.

Aquarius

The Science.

One of the most ancient of the constellations, Aquarius is a summer zodiacal constellation in the northern hemisphere, and one
of Ptolemy’s original. It is found near Pisces and Cetus. Two Messier objects are located there, M2, magnitude 6.5, a rich globular cluster, easily visible with binoculars and M 72, magnitude 9.8, another globular cluster.

Principal stars are: Sadalmelik (Alpha Aquarii), magnitude 2.9; Sadalsuud (Beta Aquarii), magnitude 2.9. Skat (Delta Aquarii), magnitude 3.3; Sadachbia (Gamma Aquarii), magnitude 3.8.

The Myths

The water bearer is associated with water, rain, floods and fountains just about all over the world.

Mesopotamia associated with the eleventh sign, the eleventh month and the return of the deluge.

Egypt: the setting of Aquarius in the Nile caused its flooding.

India: around 3000 BC it was possible to observe the full moon in this constellation every year around the time of the summer solstice, an event that was cause for celebration. This time represented the triumph of the moon god, Chandra, when he reached his maximum splendor and was drunk by the sun, Indra. Chandra was also identified with the magical drink of the gods, soma. With the sun crossing the solstice and the lengthening of daylight, the evil god of darkness and drought, Vritra represented by the constellation Hydra, was conquered. In India, the summer solstice corresponds with the return of the monsoon season and water to the land. See the Indian legends of Aquila, Hydra and Pegasus.

Greece: in antiquity, Hera’s daughter Hebe, goddess of eternal youth, was cup bearer to the gods. Zeus replaced her with the handsome boy, Ganymede, after she spilled a flask of nectar. To further irritate Hera, Zeus immortalized his favorite server with a heavenly constellation.
**Pisces**

**The Science**

Pisces is one of the 13 constellations of the Zodiac, and one of the 12 astrological constellations. It represents two fish tied by their tails. The constellation is the site of the vernal equinox, the point at which the Sun crosses the celestial equator from the Southern hemisphere into the Northern. This used to happen in Aries, but has since moved into Pisces due to the Earth’s precession.

M74 is a 9th magnitude, face on, spiral galaxy, which can just be seen with a 6-inch (150mm) telescope.

Principal stars are:  
- Alrescha Alpha Piscium, a double star, integrated magnitude 3.8;  
- Gamma Piscium, magnitude 3.7

**The Myths**

*Mesopotamia* the goddess Anunitu was a Babylonian associated with childbirth. She represents the north-eastern part of the constellation of Pisces. Another myth of the fish concerns the birth of the goddess Istar. An egg fell from the moon and landed in the River Euphrates. Two fish pushed the egg to the riverbank where the goddess hatched. In gratitude the fish were rewarded with a place in the sky.

*Greece* the goddess Aphrodite was the object of the affections of the monster Typhon. One day while she and her son Eros were walking along the Euphrates River the monster began to pursue them. In a fright, the two gods panicked. The river nymphs protected them by transforming them into twin fishes. In thanks for their aid, the image of the fish was placed in the sky.
The Science

Probably the best known and third largest, of all the constellations, Ursa Major is also known as the Plough, or Big Dipper. It is used as a kind of Celestial signpost. If you draw an imaginary line from Merak through Dubhe and continue five times as far as Dubhe is from Merak, you will find Polaris, the Pole Star. If you now draw an imaginary line along the handle of the dipper and continue the arc across the sky, this will lead you Arcturus in the constellation Boötes. If you continue further, you will reach Spica in Virgo. Following the other two stars in the bowl of the dipper (Megrez and Phecda) down below the bowl takes you to Regulus, the bright star in Leo.

The spiral galaxies M80, M81 and M82 are to be found in Ursa Major. All are easily seen in binoculars and small telescopes. M81 is one of the brightest galaxies in the sky at magnitude 7. It is tilted at an angle to us, and, thus, appears slightly elliptical.

Principal stars are:
- Dubhe - The Bear Alpha Ursae Majoris, magnitude 1.8, a double star;
- Phecda - Thigh Gamma Ursae Minoris, magnitude 2.4;
- Merak - Flank Beta Ursae Majoris, magnitude 2.4;
- Alioth Epsilon Ursae Majoris, magnitude 1.8;
- Mizar Zeta Ursae Majoris, a well known
double star, magnitude 2.3. Its companion is Alcor, magnitude 4.0. The two can be seen unaided with keen eyesight, and are easily separated with binoculars and small telescopes.

**The Myths**

*Mesopotamia* the seven stars of the Big Dipper were called the Long Wagon by the Sumerians.

*Greece* Callisto was one of Zeus’ many lovers. They met after the unfortunate damage caused following the disastrous ride of Phaëthon in the sun chariot. Zeus was checking on a particularly favorite spot of his, the land of Arcadia, when he first set eyes on the beautiful nymph Callisto. Two variations exist concerning her story and why she appears as a bear. In one story, Callisto is turned into a bear by Hera after she gave birth to Zeus’ son Arcas. Arcas grew into a great hunter as a young man. Callisto seeing her son in the woods attempted to approach him but could only growl. Seeing the bear advance on him, Arcas drew his spear. To protect the son from killing his own mother, Zeus changed Arcas into a bear as well and placed them both in the sky well within Hera’s sight every night of the year. Hera’s reward was that the two could never drink from the sea. An explanation for the great lengths of the bear’s tails lies in the fact that Zeus grabbed them both by their tails and swung them over his head before flinging them upward. The tails stretched. In the second variation of this sad story, Zeus himself turns Callisto into the bear to hide her from Hera. Hera guarantees that the boy grows to be an excellent hunter and makes sure that Callisto is in the right place at the wrong time when she confronts her son.

*North American* Iroquois tribes several Native American legends exist concerning the stars of Ursa Major, Boötes and the Corona Borealis. The Bear is represented by the four stars of the bowl in Ursa Major. Bear is hunted by Robin, Chickadee, Cowbird, Pigeon, Blue Jay and two Owls as represented by the stars of the handle in Ursa Major and several of the stars in Boötes. The Pan is the dim double star Alcor in Ursa Major. The Den is represented by two stars in Boötes and the circle of the Corona Borealis. As Bear awakens from hibernation in the spring, she leaves her Den. She is pursued by the Hunters as represented by the Birds throughout the year. Chickadee carries a Pan, the tiny star Alcor, in which she is planning to cook the meat of Bear. By the end of the fall all but the first three Hunters have given up following Bear. These Hunters,
stars in Boötes have already set. The remaining Hunters catch Bear in late autumn and she rises up on her hind legs to protect herself. Robin hits her with an arrow and Bear falls over. These changes in the direction of the animal are explained by the apparent change in the position of the constellation as viewed during this time of the year. Bear is cut up and cooked in winter, her skeleton remaining in the sky while the constellation lies on its back. Her spirit has already entered another Bear hibernating in her Den in Corona Borealis.

North American Ashinabe tribe: Fisher was a small animal but a great hunter. Hunting was difficult in those days because it was always winter. "Come with me," he told his friends, "We will go where the Earth is closest to Skyland. The Skyland is always warm and we will bring some of the warmth down to Earth." The Otter, Lynx and Wolverine traveled with Fisher up the mountains, closer and closer to Skyland. When they were very close Fisher said "We must jump up and break through to the land above the sky." The Otter jumped up and bumped his head on the sky. He fell on his back and slid all the way down the mountain. Lynx jumped up and bumped so hard it knocked him unconscious. Wolverine jumped up and bumped hard against the sky. He jumped again and again until the sky cracked a little. He jumped again and broke through. Fisher jumped through after him. They found Skyland to be a beautiful place, full of warmth and plants and flowers. They found cages full of birds which they released. The birds flew through the crack in the sky to the world below. The warmth of Skyland began to flow to the Earth and melt the snow. The Sky-People came out of the lodges and said "Thieves! They are taking our warm weather!" Wolverine escaped back through the crack but Fisher started working to make the crack bigger. He knew that if it were too small the Sky-People might be able to patch it. The Sky-People began chasing him and shooting arrows. Although he was powerful, they eventually hit a fatal spot. The great Gitchee Manitou took pity on poor Fisher because he had tried to help his friends. He healed him and placed him in the sky (Big Dipper). Each autumn as Fisher is falling towards Earth the Sky-People try to patch the crack and Winter comes. Then in spring Fisher climbs back high in the sky and reopens the crack and Summer comes.

Arabic legend: the slow movement of the stars of the bear around the pole star suggested to some people the procession of a funeral. The stars of the bowl were called the Coffin. Peoples in the Persian Gulf area saw the constellation as the representation of the funeral procession of al-
Naash who was assassinated by al-Jadi, the Pole Star. The stars of the handle were his children with Mizar as his daughter carrying her tiny son, the dim star Alcor. Later, the constellation was identified as the Litter of Lazarus with the stars of the handle associated with the women Mary, Martha, and Mary Magdalene following behind.

*Aztecs* it is Texcatlipoca, a dark god associated with death and the north. One of his feet is missing and is thought to have been eaten by a heavenly monster. This shows that the entire constellation isn’t visible from the part of Mexico where the story originated since the star that represents the missing foot is below the horizon within that area.

Basques of northern Spain the stars represent 2 bulls being followed by 2 thieves and all are watched by the herdsman and his male and female slaves. The eighth star of the constellation, Alcor, is seen as a small dog just above the second bull. Other variations have this eighth star a rat that gnaws at the straps on the yoke of the bulls.

*Celtic legend* the Great Bear is associated with King Arthur whose name is derived from Arth or Bear and Uthyr or Luminous. The rest of the constellation was called Arthur’s Wagon.

*Chinese* the 7 stars are the images of the 7 astronomical Rectors who are the masters of the reality of heavenly influences.

**Orion**

*The Science*

Possibly the most famous constellation next to the Plough (Big Dipper) in Ursa Major it is the most recognisable of constellations in the northern sky (Crux is probably the most recognisable in the southern sky.) Orion is rich in celestial objects of all kinds, so there is something for everyone with large or small telescopes or binoculars to see.

The nebulae, M42 and M43, in Orion’s sword are the birthplace of star
clusters. Near Alnitak (Zeta Orionis) is the Horsehead Nebula. The area around and below Orion's belt is rich in nebulosities.

Principal stars are: Betelgeuse Alpha Orionis, a Red giant with variable magnitude from 0.0 to 1.2. At times it can outshine Rigel; Rigel Beta Orionis, magnitude 0.1; Mintaka Delta Orionis, magnitude 2.2.

The Myths

Mesopotamia known as An or Anu the true shepherd, the name of the constellation is a variation of the Sumerian Uru-anna, Light of the Sky. His wife is Antu. According to tradition An took over heaven when it was separated from earth, creating the universe as we know it. He is son of Ansar and Kisar, and father of all the gods. In the story of the three superimposed heavens, Anu occupies the topmost heaven. The "way of Anu" is the vertical band of the eastern horizon, between the "ways" of Enlil and Enki which lie to its north and south. Anu is not a well defined god because he encompassed so many concepts. No clearly recognizable artistic representation of him has ever been identified.

The epic of Gilgamesh is probably the most complete legend connected with this constellation. Dating to over 4000 years ago, the epic was discovered inscribed on twelve clay tablets found in the library at Nineveh, each recounting some portion of the story of Gilgamesh and his friend Enkidu. Gilgamesh was an actual living man, the king of Uruk in the first half of the third millennium BC. He was a descendent of the Sumerian Noah, Utnapishtim. Strong, commanding and a lady killer, he met his rival Enkidu on the field of battle. Enkidu was his twin in size and strength, but his polar opposite in temperament. After wrestling for several days, Gilgamesh realized he could not beat Enkidu and the two became friends. For their first exploit they attacked and killed the giant Humbaba who lived in the Cedar Forest.
After witnessing his amazing strength and admiring his obvious beauty, the goddess Istar fell in love with Gilgamesh and wished to become his lover, which he refused. Istar called down the mighty Bull of heaven to destroy Uruk. Gilgamesh and Enkidu slew the animal, cutting it into pieces which Enkidu threw at Istar and her priestesses. Istar cursed the beautiful Gilgamesh with leprosy and caused Enkidu to lapse into a coma and die. Gilgamesh roamed the desert in grief for Enkidu and in fear of dying before finally returning to give his friend a proper funeral. His quest for immortality ended with the once powerful, virile king an old, broken man.

**Egypt**: representation of the solar god Horus. He is shown as riding in a boat with the star Sirius as Isis in the form of a cow in another boat behind him. The souls of Osiris and Isis are represented by Orion and Sirius.

**Greece**: the classical representation of the hero Orion shows him kneeling with his raised right arm brandishing a club, a shield or lion skin in his left. Orion was born to the childless widower Irieus, a poor shepherd, who invited the gods Zeus, Poseidon and Mercury to dinner without knowing who they were. Unable to offer them anything to eat, he butchered the only animal he had, an ox, and made them comfortable. For his sacrifice and hospitality the gods offered him anything he could want. Irieus asked for a son and Orion was born from the ox skin some months later. As Orion grew he became a great hunter, a womanizer and friend and lover of the goddess Artemis. Her brother, Apollo, became jealous of Artemis’ infatuation with Orion and attempted to have him killed by a scorpion placed on his hunting path. As Orion approached, the scorpion fled. With the hunter in pursuit it jumped into the ocean and swam with Orion close behind. Apollo placed a beam of light on the swimmer and dared his sister to hit the tiny spot on the water. Never one to pass on a chance to showcase her hunting skills, Artemis killed her lover with a single arrow. His body washed up on the shore the next day. In her sorrow she asked that Zeus place him in the sky where he could remain for eternity with his hunting dogs and the hare Lepus. Apollo insisted that the scorpion be placed in the sky as well to commemorate the hunter’s downfall. A constellation associated with Orion is Taurus, the ox from which he was born. Two star clusters, the Pleiades and the Hyades, represent daughters of Atlas who were the object of his unwanted affections. In an attempt to repel his advances the women were placed in the sky out of his reach. When Zeus agreed to allow Orion to become a constellation, he
kept the hunter far enough from the sisters so that he could chase but never catch them. The scorpion is positioned so that it faces him. Sagittarius was placed next to the scorpion, with drawn bow aimed at the scorpion’s heart should he try to advance toward Orion.

India: the lord of all creatures, Praiapati, is disguised as a deer. In love with his daughter, Rohini, represented by the star Aldebaran in Taurus, he pursues her and is stopped by the hunter Lubdhka, the star Sirius. Lubdhka’s arrow is in the deer’s back and is marked by the three stars of Orion’s belt.

North American Chinook tribe: A big canoe (Orion’s belt) and a small canoe (Orion’s dagger) are in a race to catch a salmon in the Big River (Milky Way). The little canoe is winning the race.

North American Lakota tribe: According to the Lakota, the Constellation of the Hand, namely the bottom half of the constellation Orion, represents the arm of a great Lakota chief. The gods wanted to punish the Lakota’s chief for his selfishness and made the Thunder People rip out his arm. The chief’s daughter offered to marry anyone who would recover her father’s arm.

Fallen Star, a young warrior whose father was a star and whose mother was human, returned the arm and married the daughter. The return of the arm to the chief symbolizes harmony between the gods and the people with the help of the younger generation.
The Science

Pegasus is easily recognised by 4 stars which form a large square known as The Great Square of Pegasus. One of the stars of the Great Square used to be delta Pegasi Alpheratz (Sirrah), but is now assigned to the constellation of Andromeda.

Principal stars are: Markab
Alpha Pegasi, magnitude 2.5; Scheat Beta Pegasi, variable, magnitudes 2.3 to 2.7; Algenib Gamma Pegasi, a Ceheid variable, magnitude 2.8; Enif Epsilon Pegasi, magnitude 2.4.

The Myths

Pegasus was eventually tamed by Bellerophone. One explanation for the inverted position of the horse in relation to surrounding constellations was made following Bellerophone’s attempt to reach Mount Olympus on the back of the horse. Trying to stop him, Zeus sent a horsefly to sting Pegasus. Startled, Pegasus bucked and threw Bellerophone from his back.
The constellation depicts the horse in the act of bucking. If, however, the horse is drawn upright in relation to the other constellations, the front legs of the animal rest on the pale in Aquarius' hands from which flows the Fluvius Aquarii in which Piscis Austrinus is swimming. This representation makes sense since legend names Pegasus as having brought forth the fountain of Hippocrene on Mount Helicon with the kick of his hooves. Could some ancient astronomer have inadvertently inverted the animal?

In the Rig-Veda of 3000 BC several references are made to the Aswin, the twin sons of the sky Dyaus, and brothers of Usha the Dawn. The Aswin were gods with horse heads. The importance of the depiction of the celestial horse is realized when the position of the constellation on the night of the equinox is reconstructed. The feet of the horse appear to hit the moon on this evening, spilling soma, the drink of the gods into the vessel held by Aquarius. Horses were sacred animals whose sacrifice was considered the ultimate complement to the gods.

**CASSIOPEIA**

The Science

This is a well known constellation which represents a woman sitting in a chair. It is a bright constellation lying in a rich part of the Milky Way, close to the celestial north pole and easily recognised by its large W. It can be found on the opposite side of the Pole Star to the Great Bear (Ursa Major - The Plough or Big Dipper.) It contains two open clusters, M52 & M103, integrated magnitudes 7.3 & 7.4 respectively.

Cassiopeia is circumpolar, and is visible all year round in the Northern Hemisphere.

The strongest radio source, Cassiopeia A, emanates from this constellation. It is the remains of a supernova, 10,000 light years distant, which occurred around 1660AD.

Principal stars are: Schedar - The Breast (Alpha Cassiopeiae), magnitude 2.2; Caph (Beta Cassiopeiae), magnitude 2.3; Gamma Cassiopeiae a shell star, variable, with mean magnitude 2.5; Ruchba - The Knee (Delta Cassiopeiae), magnitude 2.7.
The Myths

Cassiopeia
{kass-ee-oh-pe-a}
The Queen

**Greca** she was the vain and beautiful Queen of Philistia, sometimes referred to as Ethiopia.Claiming to have beauty that rivaled the Nereids, her punishment was the sacrifice of her daughter, Andromeda, to the sea monster Cetus. After her daughter was saved and promised to Perseus as his wife, Cassiopeia plotted with her daughter’s fiancé Agenor, to kill Perseus. While outnumbered and attacked at his wedding feast, Perseus pulled Medusa’s head from his bag and transformed Cassiopeia, Agenor and his men to stone. The Queen and King Cepheus are depicted in the sky facing each other’s feet. They cannot speak to each other. Because the Queen insulted the sea nymphs, the pair never set below the surface of the sea. The constellation’s name is derived from a Phoenician phrase that means the Rose-Colored Face.

**Assyria** she is the Mistress of Grain depicted with a palm frond or grain in her left hand. This agricultural tie brings the constellation close to the mythologies of Virgo.

**Arabic legend** known as Kaff al-Habib, the dyed hand, the constellation was eventually considered to be the hand of Fatima, the daughter of Mohammed.

**North American Yakima tribe:** A Hunter killed a great elk and stretched the skin to dry by driving wooden stakes through it. Afterwards he threw the skin into the sky (Cassiopeia) where the light above shines through the stake holes forming stars.
Boötes is one of the constellations most widely recognised by ancient cultures. It depicts a herdsman driving a bear around the sky. The proper name of the constellation's brightest star, Arcturus, roughly means 'Bearkeeper' in Greek. He is often said to be holding the lead of the hunting dogs Canes Venatici.

Principal stars are: Arcturus (Alpha Boötis), magnitude -0.04 an orange giant, and the 4th brightest star in the entire sky; Izar - Loincloth (Epsilon Boötis), magnitude 2.7 an orange giant, with a 5th magnitude blue companion - a really spectacular double star; Haris (Gamma Boötis - also known as Seginus), magnitude 3.0; Nekkar, a corruption of the Arabic for Ox-Driver, (Beta Boötis) a yellow giant, magnitude 3.5. Nu Boötis, is an easy double with binoculars, both components are magnitude 5.0.

The Myths

Saharan legend, 5744 BC: at this time the star forming the head of the constellation was the pole star. As a result, the body perfectly aligned with the meridian at midnight on each of the solstices and equinoxes. This important position would logically be held by the Titan, Atlas, who held the world on his shoulders. The tradition of Atlas was adapted into Greek mythology from earlier stories placing the garden of the Hesperides within the borders of the Sahara Desert. As the precession of the axis shifted the pole star away from this constellation, its mythology shifted as well.

Greek connections with the cult of Dionysus, the god of wine, are made in Early Greek legends. Later stories connect Boötes with Ursa Major. Icarius was the first man to learn the cultivation of grapes and their fermentation into wine. Icarius, after his death, was placed in the sky by
Dionysus in celebration of the development of fermentation and wine. His dog, Maera, became the bright star Procyon.

The legend of the Great Bear explains the naming of the bright star, Arcturus, in Boötes. Literally, the bear protector, Arcturus follows the constellation, supposedly the heavenly version of his mother, Callisto.

Another story refers to how the goddess of cultivation, Demeter, lay with the Titan Iasion and produced two sons, Plutus and Philomelus. The brothers never agreed on anything. Plutus was wealthy and never gave his brother assistance. Philomelus invented the wagon and used his profits to buy two oxen. These he used to plow and cultivate fields. In recognition of Philomelus’ ingenuity, Demeter raised him to the skies as Boötes, the plowman, with the Big Dipper as his plow.

*Rana* seen as a plowman, Boötes followed the stars of the plow, a constellation derived from the asterism known today as the Big Dipper.

### Cygnus

The Science

Also known as *The Northern Cross*, this is a constellation of the Northern Hemisphere. Cygnus represents a flying swan located in the Milky Way. The principal star, Deneb, which marks the tail of the swan, forms part of the *Summer Triangle* with Altair and Vega. Halfway down the neck of the Swan, near Eta Cygni, lies Cygnus X-1. Astronomers believe it to be a black hole within our own galaxy. It
cannot be seen, but it is a powerful X-ray source. Cygnus A, near Gamma Cygni, is a powerful radio source, believed to be the result of two colliding galaxies.

Principal stars are: Deneb Alpha Cygni, magnitude 1.3; Sadr Gamma Cygni, magnitude 2.2; Gienal, Epsilon Cygni, magnitude 2.5; Alberio Beta Cygni, a lovely double, magnitudes 3.1 & 5.1.

The Myths

Several myths concerning Zeus transforming himself into a swan in order to seduce some passing maiden abound. Two other stories explain the origin of the constellation differently. Cycnus, son of Apollo and Hyria gave three impossible tasks to the hero Phylius to perform. When Phylius was successful, Cycnus threw himself into a lake and drowned himself in shame. His mother, Hyria, threw herself into the lake in despair and they were both transformed into swans.

The poet Ovid describes the story of Cygnus, brother of Phaëthon, who roamed the land in search of his brother’s body when he died following his fall to Earth from the chariot of the sun. Phaëthon’s tortured body had fallen into the River Eridanus. Cygnus threw himself into the water and repeatedly dove beneath the surface in search of Phaëthon. In mercy, the gods transformed him into a swan. This story explains why swans wander over water seemingly in search of something and deep in thought and occasionally plunge their heads below the surface. And you thought they were just eating!

North American Shoshoni tribe: A grizzly bear (Cygnus) climbed up a tall mountain to go hunting in the sky. As he climbed, the snow and ice clung to the fur of his feet and legs. Crossing the sky the ice crystals trailed behind him forming the Milky Way.

Christian legend: the true cross on which Christ had drawn his last breath was supposedly discovered by Saint Helena, the mother of
Constantine, three centuries after the crucifixion. It is believed that the constellation represents a holy sign since it appears upright above the Western Hills at nine o’clock on the night before Christmas.